The opinion in support of the decision being entered today was ***not*** written for publication and is ***not*** binding precedent of the Board.

Paper No. 28

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex Parte NAOKO KIHARA, FUMIHIKO YUASA,
TOHRU USHIROGOUCHI, TSUKASA TADA,
OSAMU SASAKI, TAKUYA NAITO and SATOSHI SAITO

Appeal No. 1997-3051
Application 08/473,963

HEARD: January 25, 2001

Before, PAK, WALTZ and JEFFREY T. SMITH, ***Administrative Patent Judges***.

JEFFREY T. SMITH, ***Administrative Patent Judge***.

Decision on appeal under 35 U.S.C. § 134

Applicants appeal the decision of the Primary Examiner finally rejecting claims 33-45, 47-49, 51, 52 and 54. We have jurisdiction under 35 U.S.C. § 134.[1]

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[1] The claims on appeal have been amended by an after final amendment, paper no. 10, filed September 3, 1996. The Examiner indicated that upon filing the appeal, the amendment would be entered. (Paper no. 11, mailed September 17, 1996). Claims 46 and 50, the only other claims pending in this application, are objected to by the examiner as dependent on a rejected claim, but would be allowable if rewritten in independent form. (Examiner's Answer, page 2).

BACKGROUND

The invention is directed to a photosensitive composition comprising an alkali-soluble polymer, a compound which generates an acid when exposed to chemical radiation, and an acid-decomposable compound. The acid-decomposable compound has (i) at least one substituent which is an ester moiety, a tetrahydropyranyl ether group, an alkylcarbonate group or a silyl ether group, which substituent is decomposed by reaction with acid which is generated when said compound is exposed to chemical radiation, and (ii) at least one group which is converted into a -COO- or -$S0_3$- group by reaction with an alkaline solution after said decomposition of said acid-decomposable compound. Claim 33 which is representative of the invention is reproduced below:

> 33. A photosensitive composition comprising:
>
> an alkali-soluble polymer;
>
> a compound which generates an acid when exposed to chemical radiation; and
>
> an acid-decomposable compound having (a) at least one substituent which is an ester moiety, a tetrahydropyranyl ether group, an alkylcarbonate group or a silyl ether group, which substituent is decomposed by reaction with acid which is generated when said compound is exposed to chemical radiation, and (b) at least one group which is converted into a -COO- or -$S0_3$- group by reaction with an alkaline solution after said decomposition of said acid-decomposable compound.

As evidence of obviousness, the Examiner relies on the following references:

Nguyen-Kim et al. (Nguyen-Kim)	5,035,979	Jul. 30, 1991
Ushirogouchi et al. (Ushirogouchi) (Filed Mar. 29, 1990)	5,169,740	Dec. 8, 1992
Uenishi et al. (Uenishi '389) (Filed Apr. 26, 1990)	5,173,389	Dec. 22, 1992
Nakano et al. (Nakano) (Filed Apr. 5, 1991)	5,225,311	Jul. 6, 1993
Uenishi et al. (Uenishi '582) (Filed Dec. 8, 1992)	5,248,582	Sep. 28, 1993
Elsaesser et al. (Elsaesser) (Filed Jan. 30, 1991)	5,376,496	Dec. 27, 1994
Ebersole (Filed Jul. 26, 1993)	5,324,620	Jun. 28, 1994
Crivello et al. (Crivello) European Patent Application	EP 0249139	Dec. 16, 1987

THE REJECTIONS

The Examiner entered the following grounds of rejection:

Claims 33-39, 42-45, 47-49, 52 and 54 are rejected as unpatentable under 35 U.S.C. § 103 over Crivello, Nguyen-Kim, or Elsaesser in view of Uenishi '389 or Uenishi '582. (Examiner's Answer, page 5).

Claims 40 and 41 are rejected under 35 U.S.C. § 103 as unpatentable over Crivello, Nguyen-Kim, or Elsaesser in view of Uenishi '389 or Uenishi '582 further in view of Ushirogouchi or Nakano or Ebersole. (Examiner's Answer, page 8).

OPINION

Upon careful review of the entire record including the respective positions advanced by Appellants and the Examiner, we find that the Examiner has not carried his burden of establishing a ***prima facie*** case of obviousness for the subject matter of claims 33-45, 47-49, 52 and 54.

It is well established that the examiner has the initial burden under § 103 to establish a ***prima facie*** case of obviousness. ***In re Oetiker***, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); ***In re Piasecki***, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). To that end, the examiner must show that some objective teaching or suggestion in the applied prior art, or knowledge generally available in the art,or nature of the problem to be solved would have led one of ordinary skill in the art to arrive at the claimed invention. ***Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc***., 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996).

Crivello discloses photosensitive compositions comprising a combination of (i) a compound which generates an acid when exposed to activating radiation and (ii) a

compound (dissolution inhibitor) which contains acid cleavable groups. (See pages 2-5). The dissolution inhibitor is decomposed by acid liberated from an onium salt, when the composition is exposed to radiation.

Nguyen-Kim discloses photosensitive compositions comprising a combination of (i) a compound which generates an acid when exposed to activating radiation, (ii) a compound (dissolution inhibitor) which contains acid cleavable groups and (iii) a binder. (Column 2, lines 28-56). The dissolution inhibitor compound (ii) ester groups are decomposed by the acid liberated from the compound (i). (Column 5, line 55 to column 6, line 58).

Elsaesser discloses positive photosensitive compositions comprising a combination of (i) a compound which generates an acid when exposed to activating radiation and (ii) a compound (dissolution inhibitor) which contains acid cleavable groups. (Column 2, lines 12-36). The dissolution inhibitor composition is a 1,2-quinone diazide compound and/or a combination of a compound which forms a strong acid when exposed to actinic radiation and a compound containing at least one acid cleavable C-O-C bond. (Column 5, line 50 to column 6, line 31). Thus, the dissolution inhibitor contains at least one acid-cleavable ether bond which is decomposed by the acid liberated from the acid generating compound.

Uenishi ‘389 and ‘582 disclose positive type photosensitive compositions comprising a binder and a photosensitive dissolution inhibitor. The dissolution inhibitor contains a multi-aromatic ring compound, which contains a cyclic ring system constituted of heteroatoms and quinone diazide radicals. (‘389, column 2 line 36 to column 8, line 24; ‘582 column 2, line 34 to column 3, line 68). Uenishi discloses quinone diazide dissolution inhibitor compounds produce an alkali-soluble substance when irradiated with light to undergo decomposition. (‘389, column 1 lines 30-35; ‘582 column 1, lines 50-57). Uenishi does not disclose the presence of a compound which forms an acid upon exposure to radiation or that the dissolution inhibitor contains groups which are cleaved by an acid.

According to the examiner “[i]t would have been obvious to substitute the acid-decomposable compound of Uenishi et al. [sic, ‘389 or ‘582] into the compositions [sic, of] Crivello et al., Nguyen-Kim et al., or Elsaesser et al. One of ordinary skill in the art would have been motivated to make this substitution because of the teaching of Uenishi et al. that these compounds provide resists which are capable of forming a pattern with vertical side walls, have broad development

latitude and provide resist images with excellent heat resistance.” (Examiner’s Answer, page 8, third paragraph).

We disagree with the Examiner's factual basis underlying this rationale to establish ***prima facie*** obviousness. The light sensitive material of Uenishi '389 and '582 is sensitive to actinic radiation because of the reaction of a novolak resin with at least one 1,2-quinone diazide group. ('389, column 2 lines 11-31; '582 column 4, lines 50-55). Uenishi '389 and '582 do not describe a component which generates an acid when exposed to activating radiation. The decomposable compounds of Crivello, Nguyen-Kim and Elsaesser contain groups which are cleaved by acid. Uenishi's dissolution inhibitors are fundamentally different because they form an alkali-soluble substance when subjected to radiation. Consequently, one of ordinary skill in the art would not have been motivated to substitute the dissolution inhibitors of Uenishi '389 and '582 for the decomposable compound of Crivello, Nguyen-Kim or Elsaesser.

The Examiner adds the Ushirogouchi, Nakano and Ebersole references to the above applied references to reject the subject matter of claims 40 and 41. The Examiner states "[i]t would have been obvious to one of ordinary skill in this art at the time of the invention to substitute the novolak copolymers of Ushirogouchi et al., Nakano et al., or Ebersole in the compositions of Crivello et al., Nguyen-Kim et al., Elsaesser et al. in view of Uenishi et al." (Examiner's Answer, page 10, first paragraph). Claims 40 and 41 are dependent claims which include the limitations of claim 33. The substitution of the novolak copolymers of Ushirogouchi, Nakano or Ebersole in the compositions of Crivello,

Nguyen-Kim or Elsaesser would not have led to the claimed invention because the substitution of the novolak copolymer does not address the deficiencies of Crivello, Nguyen-Kim, Elsaesser stated above.

In the absence of sufficient factual evidence or scientific rationale on the part of the Examiner to establish why and how a skilled artisan would have arrived at the subject matter of claims 33-45, 47-49, 52 and 54 from the applied references, we find that the Examiner has failed to meet the initial burden of establishing the ***prima facie*** obviousness of the claimed subject matter. Accordingly, we are constrained to reverse the Examiner*s rejection of claims 33-45, 47-49, 52 and 54.

CONCLUSION

The rejection of claims 33-39, 42-45, 47-49, 52 and 54 as unpatentable under 35 U.S.C. § 103 over Crivello, Nguyen-Kim, or Elsaesser in view of Uenishi '389 or Uenishi '582 is reversed.

The rejection of claims 40 and 41 under 35 U.S.C. § 103 as unpatentable over Crivello, Nguyen-Kim, or Elsaesser in view of Uenishi '389 or Uenishi '582 further in view of Ushirogouchi or Nakano or Ebersole is reversed.

REVERSED

CHUNG K. PAK Administrative Patent Judge	)
THOMAS A. WALTZ Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
JEFFREY T. SMITH Administrative Patent Judge	)

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